

REMARKS

Claims 1-14 are pending and stand ready for further action on the merits.

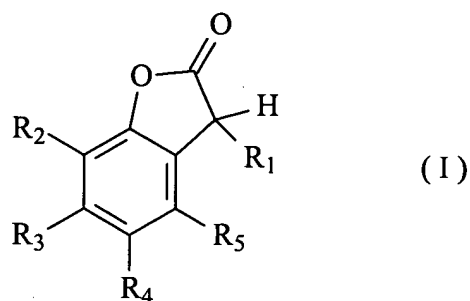
Issues Under 35 U.S.C. § 102 and § 103

Claims 1 and 2 are rejected under 35 U.S.C. § 102(b) as being anticipated by Nesvadba et al., USP 5,614,572; and claims 3-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Nesvadba et al.

Applicants respectfully traverse each of the rejections.

Applicants respectfully submit that the inventive claims are neither anticipated nor rendered obvious by Nesvadba et al. in view of the structural distinctions between the inventive benzofuranone and the benzofuranone of Nesvadba et al. It appears from the Examiner's comments that the Examiner has not considered these structural distinctions in preparing the outstanding Office Action.

The inventive claims are drawn to an aromatic monovinyl resin composition which comprises 0.006-0.5 percent by weight of component (b) which is a 3-arylbenzofuranone represented by the following formula (I):



In the inventive formula (I), R_1 can be a carbocyclic aromatic group.

Nesvadba et al. teach similar aromatic monovinyl resin compositions comprising benzofuranones of the above formula wherein R_1 is $-OR'_1$ and wherein R'_1 can be a benzoyl group. The inventive claims are different from Nesvadba et al. in that the benzofuranone of formula (I) has the carbocyclic aromatic group bonded directly to the carbon in the furanone ring whereas the benzofuranone of Nesvadba et al. has the phenyl group (of the benzoyl group) bonded to the furanone ring through an $-OC(O)-$ group.

Nesvadba et al. do not anticipate nor render obvious the inventive claims, since Nesvadba et al. fail to teach or fairly suggest modifying the benzofuranone compounds by bonding the phenyl group directly to the carbon in the furanone ring and not through an $-OC(O)-$ group.

Furthermore, the present invention relates to an aromatic monovinyl resin composition containing a smaller amount of residual aromatic monovinyl monomer. Specifically, the

composition is characterized by having the residual amount of the aromatic monovinyl monomer of not more than 100 ppm, as recited in claim 1. The present invention further relates to the products, such as a formed sheet, comprising the resin composition, and to a method for producing the resin composition. The inventive products have good color tones and appearances but have little odor.

The composition of the present invention is produced by a method wherein a specific heat deterioration inhibitor is added at a specific concentration. Specifically, 3-arylbenzofuranone of formula (I) is added during polymerization step, before the devolatilizing step, or during the devolatilizing step in the method according to the present invention. By employing this method, a composition with significantly less residual monomer content was obtained for the first time.

As mentioned above, the Examiner firstly alleges in the Action that claims 1 and 2 are clearly anticipated by U.S. 5,614,572A to Nesvadba et al. Specifically, the Examiner states that Nesvadba et al. discloses aromatic vinyl monomer based polymers and arylbenzofuranone compounds which directly correspond to those of the present invention.

Nesvadba et al. indeed discloses that certain benzofuranone compounds can be used for stabilizing organic materials against oxidative, thermal or light-induced degradation. It is also noted that the benzofuranone compounds disclosed in Nesvadba et al. is

represented by formula (I), as reproduced above, which is the same as formula (I) recited in claim 1 of the present application. As a matter of fact, however, the benzofuranone compounds in Nesvadba et al. and the 3-arylbenzofuranone compounds in the present invention differ from each other in the possible substituents thereon, namely R_1 in the formula (I).

In the present invention, R_1 can be a carbocyclic aromatic group.

On the other hand, in Nesvadba et al., R_1 is halogen or $-OR'_1$, wherein R'_1 can be a benzoyl group. Therefore, the benzofuranone compounds in Nesvadba differ from 3-arylbenzofuranone in the present invention in that 3-arylbenzofuranone in the present invention has the carbocyclic aromatic group bonded directly to the carbon in the furanone ring whereas the benzofuranone of Nesvadba et al. has the phenyl group (of the benzoyl group) bonded to the furanone ring through an $-OC(O)-$ group.

Claims 1 and 2 are, therefore, not anticipated by Nesvadba et al.

With regard to the rejection under 35 U.S.C. §103(a), the MPEP instructs that all claim limitations must be taught or suggested by the prior art to establish a *prima facie* case of obviousness. See MPEP §2143.03.

Nesvadba et al. neither teaches nor fairly suggests modifying the benzofuranone compounds by bonding the phenyl group directly to the carbon in the furanone ring and not through an -OC(O)- group. Considering that it is difficult to predict the property of a compound from its chemical structure, the composition of claims 1 and 2 comprising a different compound from that disclosed as a stabilizer in Nesvadba et al. are not obvious over Nesvadba et al.

The Examiner further alleges that the claims 3-14 should be rejected as being obvious over Nesvadba et al.

As asserted above, Nesvadba et al. fails to teach or fairly suggest the use of the specific 3-benzofuranone compound as recited in claim 1. The products of claims 3-14 comprising the composition of claim 1 and the methods for producing the composition of claim 1 according to claims 7-14 are, therefore, non-obvious over Nesvadba et al. for the reason set forth above.

Thus, the obviousness rejection over Nesvadba et al. should be withdrawn.

In addition to the above-described difference in the structure of benzofuranone compounds, the applicant submits that the present invention is non-obvious over Nesvadba et al. for the following reason.

Although Nesvadba et al. describe that the benzofuranone compound can be used for stabilizing wide variety of organic materials, the stabilization of polypropylene during multiple-

extrusion (Example 7) is only one example of the actual use of a benzofuranone compound disclosed in Nesvadba et al. Specifically, in Example 7, benzofuranone compound is added to a commercially available polypropylene, together with other additives. The polymer blend is then extruded 3 times. The results of Example 7 (Table 2) thus merely suggest that the stabilization of polypropylene during multiple-extrusion was achieved.

Example 7 is, in fact, only one example that illustrated the stabilizing effect of the benzofuranone compound of Nesvadba et al. There is no specific example of the addition of a benzofuranone compound during the polymerization of an organic material to be stabilized or during the devolatilizing step. It is, therefore, reasonable to acknowledge that Nesvadba et al. fails to teach or fairly suggest using a stabilizer in polymerization step or devolatilizing step. The purpose of using a benzofuranone compound in Nesvadba et al. is merely to protect the final organic material, such as a polymer, against thermal, oxidative or light-induced degradation (See Abstract), but is not to inhibit the monomer, dimer and trimer production during the polymerization step or the devolatilizing step.

The aromatic monovinyl resin composition of the present invention that is obtainable by adding a specific 3-arylbenzofuranone compound during polymerization step, before the devolatilizing step, or during the devolatilizing step, the

products comprising such a resin compound and the method for producing such a resin compound are, therefore, clearly non-obvious over Nesvadba et al.

By using the aromatic monovinyl resin composition according to claim 1, the products characterized by:

- having less odor, excellent appearance and color tone, less die lines formed upon extrusion molding and superior printability; and
- having less oil adhesion upon injection molding, less unevenness in the thickness, superior expansion moldability, and less adhesion to its surface of the contaminant produced on die part upon molding,

can be produced.

These advantages of the composition and products of the present invention are concretely illustrated in Examples 1-9 (Table 1 and 2) in the present application. These advantageous effects brought about by the present invention further support the unobviousness of the present invention. As such, withdrawal of each of the rejections is respectfully requested.

Conclusion

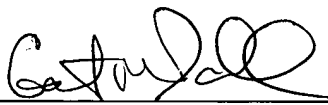
In view of the above amendments and comments, Applicants respectfully submit that the claims are in condition for allowance. A notice to such effect is earnestly solicited.

If the Examiner has any questions concerning this application, he is requested to contact Garth M. Dahlen, Ph.D., Esq. (#43,575) at the offices of Birch, Stewart, Kolasch & Birch, LLP.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under § 1.17; particularly, extension of time fees.

Respectfully submitted,

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